AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An excitation vector generator, comprising:

a providing system that provides an input vector having at least one pulse, each pulse of said at least one pulse having a predetermined position and a predetermined polarity;

a storage system that stores at least one fixed waveform; and

a convolution system that enables modification of said input vector with said at least one fixed waveform to transform a waveform of said input vector, said convoluting system outputting said transformed input vector as an excitation vector to improve a speech quality when a random code vector is decoded with said input vector,

wherein the excitation vector is configured to be further convoluted with an impulse response of a synthesis filter to output synthesized speech.

2. (Original) The excitation vector generator of claim 1, wherein said input vector comprises a sparse vector.

3. (Original) The excitation vector generator of claim 1, wherein said input vector is provided from an algebraic codebook.

4. (Original) The excitation vector generator of claim 1, wherein said input vector comprises a vector having a plurality of non-zero samples.

5. (Original) The excitation vector generator of claim 1, wherein said convolution system performs a convolution using one fixed waveform of said at least fixed waveform that is read from said storage system.

6. (Original) The excitation vector generator of claim 1, wherein said convolution system spreads an energy distribution of said input vector over a subframe.

7. (Original) The excitation vector generator of claim 1, wherein said at least one fixed waveform comprises three different fixed waveforms.

8. (Original) The excitation vector generator of claim 1, wherein said at least one fixed waveform comprises three different fixed waveforms having a different amount of energy spreading.

9. (Currently Amended) An excitation vector generator, comprising:

a providing system that provides an input vector having a plurality of non-zero samples;

a storage system that stores at least one fixed waveform; and

a convolution system that transforms said input vector with said at least one fixed waveform to enable a modification of an energy distribution of said input vector, said convolution system outputting said transformed input vector as an excitation vector to improve a speech quality when a random code vector is decoded with the input vector,

wherein the excitation vector is configured to be further convoluted with an impulse response of a synthesis filter to output synthesized speech.

10. (Original) The excitation vector generator of claim 9, wherein said convolution system disperses said energy distribution of said input vector.

11. (Original) The excitation vector generator of claim 9, wherein said energy distribution is modified by spreading an energy of each non-zero sample of said plurality of non-zero samples over each sample adjacent to said plurality of non-zero samples.

12. (Original) The excitation vector generator of claim 9, wherein said energy distribution is modified by spreading an energy of each non-zero sample of said plurality of non-zero samples around each of said plurality of non-zero samples.

13. (Original) The excitation vector generator of claim 9, wherein said energy distribution is modified by spreading an energy of each non-zero sample of said plurality of non-zero samples over each area adjacent to said plurality of non-zero samples.

14. (Original) The excitation vector generator of claim 9, wherein said convolution system performs a convolution using a fixed waveform read from said storage system.

15. (Original) The excitation vector generator of claim 9, wherein said convolution system spreads an energy distribution of said input vector over a subframe.

16. (Original) The excitation vector generator of claim 9, wherein said at least one fixed waveform comprises three fixed waveforms, each fixed waveform of said three fixed waveforms having a different waveform.

17. (Original) The excitation vector generator of claim 9, wherein said at least one fixed waveform comprises thee fixed waveforms, each fixed waveform of said three fixed waveforms having a different amount of energy spreading from one another.

18. (Currently Amended) A method of generating an excitation vector, comprising:

receiving a code number corresponding to at least one position;

providing an input vector corresponding to the received code number;

reading out at least one pre-stored fixed waveform from a storage system;

convolution processing the input vector and the at least one fixed waveform to generate an excitation vector; and

outputting the generated excitation vector to improve a speech quality when a random code vector is decoded with the input vector,

wherein the excitation vector is configured to be further convoluted with an impulse response of a synthesis filter to output synthesized speech.

19. (Original) The method of claim 18, wherein providing an input vector comprises providing a sparse vector.

20. (Currently Amended) A method for generating an excitation vector, comprising:

providing an input vector having at least one pulse, each pulse of the at least one pulse having a predetermined position and a predetermined polarity;

storing at least one fixed waveform; and

convoluting the input vector with the at least one fixed waveform so that a transformed excitation vector is produced, the transformed excitation vector being output to improve a speech quality when a random code vector is decoded with the input vector,

wherein the excitation vector is configured to be further convoluted with an impulse response of a synthesis filter to output synthesized speech.

21. (Currently Amended) A method for generating an excitation vector, comprising:

providing an input vector having a plurality of non-zero samples;

storing at least one fixed waveform; and

convoluting the input vector with the at least one fixed waveform to enable a modification of an energy distribution of the input vector, which is output as an excitation vector to improve a speech quality when a random code vector is decoded with the input vector,

wherein the excitation vector is configured to be further convoluted with an impulse response of a synthesis filter to output synthesized speech.